
SUBJECT AREA CONTENT

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Management System: [Work Planning and Control](#)

Subject Area: Work Planning and Control for Experiments and Operations

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Effective Date: **Oct 2, 2007** ([Rev 4.5](#))
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Introduction

The purpose of this subject area is to establish requirements at Brookhaven National Laboratory (BNL) so that all work is properly managed by using a level of planning and control commensurate to the Environment, Safety, Security, and Health (ESS&H) hazards, job complexities, and work coordination needs.

This subject area establishes work control processes based on the Integrated Safety Management (ISM) Core Functions to define the scope of work, identify the hazards, develop controls, work within the controls, and provide feedback for continuous improvement. The subject area provides a graded approach to manage a wide range of operational and experimental activities from routine to highly complex, and integrates other safety practices and subject areas such as hazard analysis tools, training requirements, and environmental management into work planning. For this subject area, "work" is defined as the activities that involve the design, set-up, operation, maintenance, modification, construction, demolition, or decommissioning of facilities, equipment, or experiments by BNL or non-BNL staff.

BNL uses four practices to plan and control work and they are categorized by the hazards, complexities, and job coordination levels. The [Work Planning and Control](#) Management System Description describes these practices. "Experimental Safety Review (ESR)" and "Work Planning and Control for Operations," are covered in detail in this subject area. The others, "Project Management" and "Standard Operating Procedures," are covered in other subject areas.

These four practices for planning and controlling work are as follows:

1. Experimental Safety Review - All organizations conducting experiments use this practice to identify the hazards, plan the work controls, and authorize the experiment. The subject area allows a graded approach to determine the level of planning rigor needed in the documentation. Each Department/Division uses an Experiment Review Coordinator or

Committee to determine if a proposed or modified experiment requires a new Experiment Safety Review Committee (ESRC) review or if it fits within established controls from previous reviews.

2. Work Planning and Control for Operations - This practice applies to all physical work performed by BNL and non-BNL staff, and also uses a graded approach to identify hazards, risks, and complexity levels, and to establish the level of rigor for planning and review. The practice allows three approaches for work planning and control: (1) worker planned, (2) prescribed, and (3) permit planned.

The "worker planned work" concept recognizes the skill levels and technical capabilities of the crafts, technicians, and scientists to handle certain duties with minimum documentation (i.e., risk, low complexity and low coordination). Worker planned job activities do not require the level of rigor detailed in permit planned work. Evaluation of worker planned tasks is conducted by the individual Department/Division, based on the specific activities they perform. Line Management is responsible for ensuring that their workers are trained to the level required, to perform tasks they are assigned.

The "prescribed work" practice relies on instructional work documents (e.g., written and approved internal procedures, contractor health and safety plan, contractor procedure, and vendor operating or maintenance manuals). The level of detail in prescribed work documents must be such that the individual who is assigned to carry out the action can understand both the reasons for the action, and each step, task, or behavior to safely and effectively implement the action.

The "permit planned work" practice requires use of a site-wide Work Permit Form for all moderate- and high-hazard work that is not covered by prescribed work documents.

3. Project Management - This process provides the overarching standards by which some work is planned and executed at BNL to meet both the customers' objective and BNL's mission within schedule and cost constraints. These standards provide project controls that bound existing departmental procedures. The individual Departments/Divisions use specific operational procedures for project management to plan and manage capital and expense projects. These lower level implementation requirements establish the detailed methodology for project management plans, project tracking methods, scheduling systems, and other management techniques. See the [Project Management](#) Subject Area for more information.

4. Standard Operating Procedures (SOP) -This process provides the requirements for developing and controlling standard/internal operating procedures for tasks that are repetitive and typically impact only a specific organization. The process requires a hazards analysis, work controls, and work instructions with details commensurate to the complexity of the operation or job. See the [Internal Controlled Documents](#) Subject Area for more information.

Some work may require a combination of the processes; for example, a planned experiment will require an Experimental Safety Review, but may also need a work permit to assemble the experiment, an operating procedure (SOP) to provide instructions to operate the experiment, plus a work permit to safely dismantle the experiment.

BNL's Training and Qualification Program provides the system and the requirements for staff to have the necessary training for work that is considered within their normal assignments. See the [Training and Qualifications](#) Subject Area and the [Training and Qualifications](#) Web Site for more information.

BNL's Integrated Assessment Subject Area sets the requirements for assessing the performance of these processes. The [Work Control Self-Assessment](#) and the [Self-Assessment Aid for Planning and Control of Experiments](#) provide tools for accomplishing this.

Graded Approach

ISM Guiding Principle #6 states that hazard controls shall be "tailored" to the work being performed. A graded approach is used to apply a level of planning rigor, work controls, and documentation commensurate to the level of ESS&H risks, work complexity, and coordination requirements. In the BNL work control system, jobs can be classified into low-, moderate-, or high-hazard categories using a graded approach. See the section [Application of the Graded Approach](#) in the [Graded Approach for Quality Requirements](#) Subject Area.

Contents

Section	Overview of Content (see section for full process)
1. Experimental Safety Review	<ul style="list-style-type: none">• Write Experimental Safety Review.• ESRC reviews experiments or significant modifications to experiments for ES&H concerns, appropriate controls, and approval.• Notify other Departments/Divisions about hazards associated with an experiment or significant modifications.• Approve experiment and document approval.• Monitor and assess experiments to ensure they are conducted safely.• Review long-term experiments; ensure design and operation experiment has not changed since its last approval.• Terminate experiment.• Complete ISM flowdown questions for experimental work through the web requisition process.
2. Work Planning and Control for Operations	<ul style="list-style-type: none">• Select, train, qualify Work Control Managers/Coordinators.• Identify, analyze, and control hazards for prescribed work.• Develop and use Work Permit.• Control work/job change.• Post job reviews, feedback and improvement.• Close out Work Permit.• Complete ISM flowdown questions to contractors and suppliers through the web

requisition process.

- Use Standing Work Permits as appropriate.

[3. Worker Planned Work](#)

[4. Work Observations](#)

- Identify, analyze, and control hazards for worker planned work.
- Determine time frame, scope, and resources for observing work.
- Categorize observations.
- Observe worker, and discuss observation with worker.
- Document observations.
- Send lessons learned to Lessons Learned Coordinator.
- Determine how to approach tasks at different work sites.
- Follow procedures and safety requirements.
- Create off-site Radiological Work Permit (RWP), if required.
- Comply with requirements for shipping hazardous materials, if necessary.
- Determine if work permit is required.
- Review proposed experiment to determine if ESR should be written.

[5. Off-site Work](#)

[Definitions](#)

Exhibits

[Department Notifications Table](#)

[ESH&Q Considerations When Designing an Experiment](#)

[Examples of Low, Moderate, and High Tasks](#)

[Experimental Safety Review Contents](#)

[Experimental Safety Review Flowchart](#)

[Guidance in Conducting Off-site Work](#)

[Instructions for Filling out the Work Permit](#)

[Job Safety Analysis](#)

[Medical Precautions While on Foreign Travel](#)

[Personnel Safety During Foreign Travel](#)

[Qualification Matrix](#)

[Security Checklist](#)

[Self-assessment Aid for Planning and Control of Experiments](#)

[Work Control Self-assessment](#)

[Work Planning and Control Operations Flowchart](#)

Forms

[Contractor Health and Safety Plan \(HASP\) Checklist](#)

[Contractor Health and Safety Plan \(HASP\) Template](#)

[Experiment Safety Review Form](#)
[Screening Guidelines for Work Permit Determination](#)
[Work Permit Form](#)

Training Requirements and Reporting Obligations

This subject area contains training requirements. See the [Training and Qualifications](#) Web Site.

This subject area does not contain reporting obligations.

External/Internal Requirements

Requirement Number	Requirement Title
10 CFR 830, Subpart A	Energy, Nuclear Safety Management, Quality Assurance Requirements
21 CFR 1300-1309	Controlled Substances
29 CFR 1910	Labor/Occupational Safety and Health Standards
40 CFR 82	Protection of Environment /Protection of Stratospheric Ozone
6 NYCRR 200 - 234	New York State Department of Environmental Conservation/Prevention and Control of Air contamination and Air Pollution
BSA Contract No. DE-AC02-98CH10886 - Clause I.86	Integration of Environment, Safety and Health into Work Planning and Execution
M 413.3-1	Project Management for the Acquisition of Capital Assets
NYS Title 10, Section 80	Controlled Substances
O 151.1B	CRD - Comprehensive Emergency Management
O 226.1A	Implementation of Department of Energy Oversight Policy
O 414.1C	Quality Assurance
O 420.2B	CRD - Safety of Accelerator Facilities
O 450.1 Change 3	Environmental Protection Program
P 450.7	Environment, Safety and Health (ESH) Goals
P 456.1	Secretarial Policy Statement on Nanoscale Safety

References

[Approach to Nanomaterial ESH](#) Interim Procedure

BNL [Lessons Learned](#)

[Biosafety in Research](#) Subject Area

[Bloodborne Pathogens](#) Subject Area

[BNL Counterintelligence Office](#)

[BNL Hazard Identification Tool](#)

[BNL Safety Observation Database](#)

[Brookhaven Training Management System \(BTMS\)](#)

[Business Systems Division \(BSD\)](#) home page

[Calibration](#) Subject Area

[Centers for Disease Control and Prevention \(CDC\)](#) Web Site

[Chemical Management System](#)

[Community Involvement and Communications in Laboratory Decision-Making](#) Subject Area

[Compressed Gas Cylinders and Related Systems](#) Subject Area

[Confined Spaces](#) Subject Area

[Construction Safety](#) Subject Area

[Cryogenic Safety](#) Subject Area

[Department/Division Work Control Managers and Work Control Coordinators](#) Web Site

[Document Control](#) Subject Area

[Domestic Travel](#) Subject Area

[Drinking Water](#) Subject Area

[Electronic Work Permit](#)

[Engineering Design](#) Subject Area

[Environment, Safety, Health and Quality \(Tier I\) Inspections](#) Subject Area

[Environmental Assessments and ESH Management Review](#) Subject Area

[Environmental Monitoring](#) Subject Area

[Event/Issues Management](#) Subject Area

[Environmental Aspects and Impacts](#) Subject Area

[Exhaust Ventilation](#) Subject Area

[Facility Use Agreements](#) Subject Area

[Fire Safety](#) Subject Area

[Fitness for Duty, Requesting Determination](#) of Subject Area

[Graded Approach for Quality Requirements](#) Subject Area

[Hazard Analysis](#) Subject Area

[Hazardous Waste Management](#) Subject Area

[Inspections and Acceptance](#) Subject Area

[Integrated Assessment](#) Subject Area

[International SOS](#)

[Issuing and Use of Personnel Monitoring Devices](#) Subject Area

[Laser Safety](#) Subject Area

[Lifting Safety](#) Subject Area

[Liquid Effluents](#) Subject Area

[Lockout/Tagout](#) Subject Area

[Materials Requiring Special Handling \(Including Age Sensitive Material\)](#) Subject Area

[Medex Assistance](#)

[Mixed Waste Management](#) Subject Area

[National Environmental Policy Act \(NEPA\) and Cultural Resources Evaluations](#) Subject Area

[Natural Hazards in the Environment](#) Subject Area

[Noise and Hearing Conservation](#) Subject Area

[Nonconformances, Identifying and Reporting](#) Subject Area

[Non-Radioactive Airborne Emissions](#) Subject Area

[Occurrence Reporting and Processing System \(ORPS\)](#) Subject Area

[Official Foreign Travel](#) Subject Area

[Oxygen Deficiency Hazards \(ODH\), System Classification and Controls](#) Subject Area

[PCB Management](#) Subject Area

[Personal Protective Equipment](#) Subject Area

[Piping Systems, Identification of](#) Subject Area

[Pollution Prevention and Waste Minimization](#) Subject Area

[Pressure Safety](#) Subject Area

[Process Assessment](#) Subject Area

[Project Management](#) Subject Area

[Purchase Requisition Review for Quality-related Requirements](#) Subject Area

[Radioactive Airborne Emissions](#) Subject Area

[Radioactive Waste Management](#) Subject Area

[RF and Microwave Safety](#) Subject Area

[Radiological Control Procedures](#)

[Radiological Stop Work](#) Subject Area

[Readiness Evaluations](#) Subject Area

[Records Management](#) Subject Area

[Regulated Medical Waste Management](#) Subject Area

[Selection, Issuance, Use and Termination of Personnel Monitoring Devices, Radiological Control Procedures](#)

[Static Magnetic Fields](#) Subject Area

[Stop Work](#) Subject Area

[Storage and Transfer of Hazardous and Nonhazardous Materials](#) Subject Area

[Supplier Pre-Award Evaluation](#) Subject Area

[Suspect/Counterfeit Items](#) Subject Area

[Training and Qualifications](#) Subject Area

[Training and Qualifications](#) Web Site

[Transfer of Hazardous and Radioactive Materials On-site](#) Subject Area

[Transportation of Hazardous and Radiological Materials Off-site](#) Subject Area

[Underage Workers \(Minors\)](#) Subject Area

[U.S. Department of State](#) Web Site

[Underground Injection Control](#) Subject Area

[United Educators](#) Web Site

[Using Controlled Substances in Research](#) Subject Area

[Work Planning and Control](#) Management System Description

Standards of Performance

Managers shall analyze work for hazards, authorize work to proceed, and ensure that work is performed within established controls.

Managers shall ensure that work is planned to prevent pollution, minimize waste, and conserve resources, and that work is conducted in a cost-effective manner that eliminates or minimizes environmental impact.

All staff and users shall identify, evaluate, and control hazards in order to ensure that work is conducted safely and in a manner that protects the environment and the public.

All staff and guests shall comply with applicable Laboratory policies, standards, and procedures, unless a formal variance is obtained.

All staff and guests shall assure that only appropriately authorized individuals have access to facilities, information, resources, and assets.

All staff and users shall conduct work within the facility-specific operational boundaries specified in Facility Use Agreements.

The only official copy of this file is the one on-line in SBMS.

Before using a printed copy, verify that it is the most current version by checking the *effective date*.

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Questions/Comments

Disclaimer

PROCEDURE: 1. EXPERIMENTAL SAFETY REVIEW

Management System: Work Planning and Control		
Subject Area: Work Planning and Control for Experiments and Operations		
1. Experimental Safety Review		
Effective Date: Oct 2, 2007	Subject Matter Expert: Christopher Johnson	Management System Steward: Michael Bebon

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Applicability

This information applies to BNL staff and non-BNL staff planning and conducting experiments.

Required Procedure

This section applies to all existing or proposed experimental activities conducted under BNL control. The rigor of the review and documentation must be commensurate with the level of hazard using a "graded approach." The overall goal is that all experiments operate in a way that ensures they are carried out safely and within an environmentally secure manner. Experiments must be reviewed and approved at the Departmental/Divisional level. Expertise from Subject Matter Experts will be obtained from other Department/Divisions as necessary. Experiments with significant hazards and consequences could require a higher level of independent review, documentation, and approval. The Experimental Safety Review Committee makes this determination.

Each Associate Laboratory Director and each Department Chair/Division Manager are ultimately responsible for the safe conduct of experiments within their organizations. This section references many companion SBMS documents that provide more detailed information on specific hazards, documentation requirements, operating limits, and start-up criteria.

If hazards of an experiment cannot be adequately identified and controlled by this section, use the section [Work Planning and Control for Operations](#). This situation may arise during setting up or tearing down an experiment, especially if non-BNL or non-project staff do these activities, and if significant construction and assembly is required.

Departments/Divisions may assign responsibilities and roles differently in their procedures versus the assignments indicated in this section. However, Departments/Divisions must ensure all responsibilities described in the steps are assigned to qualified people.

Note: Although this section has been designed as an implementing procedure, each

Department/Division may establish a specific procedure for their area. If a specific Departmental/Divisional procedure is used, it must be maintained so that it is current with the contents of this subject area. Consult with your Department/Division management to determine appropriate use of procedures.

Experimental Safety Review contains eight subsections:

[1.1 Experimental Safety Review](#)

[1.2 Experimental Safety Review Committee](#)

[1.3 Notifications to Other Departments/Divisions](#)

[1.4 Experimental Approval](#)

[1.5 Operations](#)

[1.6 Review of Long-term Experiments](#)

[1.7 Experimental Termination](#)

[1.8 Integrated Safety Management \(ISM\) Flowdown for Experimental Work through the Web Requisition Process](#)

1.1 Experimental Safety Review

The Experimental Safety Review (ESR) is a document that identifies all experimental hazards and hazard mitigations. The review establishes controls and operational limits (as required) for the proposed experiment. (The [Experiment Safety Review Form](#), or an equivalent form, may be used to format the review. Regardless of the format, the idea is to incorporate the components of the [Experimental Safety Review Contents](#) exhibit).

Generic controls may be established so that similar and routine or repetitive experiments do not need new Experimental Safety Reviews. In this case, the Chair of the Experimental Safety Review Committee or the Experimental Review Coordinator (ERC) may decide to generate a new Experimental Safety Review. See the [Experimental Safety Review Flowchart](#) for an overview of the review process.

Step 1	The Department Chair/Division Manager appoints an Experimental Review Coordinator (ERC). Note: All ERCs are required to take appropriate WP&C Training, such as WP&C CBT Course TQ-Work Plan or approved equivalent.
Step 2	Before its initiation, the Principal Investigator/Responsible Person (PI/RP) notifies the ERC of his/her intent to conduct a new experiment or modify an existing one.
Step 3	Depending on the hazards associated with the experiment, the ERC determines if an Experimental Safety Review (ESR) is required, and if outside subject matter experts (SME) are needed, or both. Note: If a proposed experiment falls within the controls and operational limits of a previously defined envelope or a previous experiment's safety review, and the experiment will be operated within those controls and limits, then there is no requirement to write a new ESR. The PI/RP or ERC should reference the existing ESR.

Step 4	<p>The PI/RP, working with the ERC and other SMEs (as necessary), writes an Experimental Safety Review.</p> <p>See the exhibit Experimental Safety Review Contents, which outlines the required contents (as applicable) that must be addressed in the review. Other considerations to ensure proper control of the experimental hazards may be added to the review as appropriate.</p> <p>Note: Departments/Divisions may use other mechanisms or similar documents to record these requirements.</p>
Step 5	<p>When generating controls and operational limits, in step 4, the PI/RP and the ERC should consider the following items based on Hazard Control methods using the following hierarchy when practical: (1) Elimination/Substitution of hazards, (2) Engineering Controls, (3) Administrative Controls and Work Practices, (4) Personal Protective Equipment (PPE):</p> <ul style="list-style-type: none"> • Security Requirements (see the exhibit Security Checklist); • Limits on operating variables (i.e., current, voltages, pressures, flows, temperatures, energy potentials, radiation levels) required to control risk to staff; • Chemicals; • Lasers; • ALARA optimization techniques; • Requirements related to the calibration, testing, maintenance, or inspection of equipment needed to protect personnel or the environment; • Requirements for protection of the environment; • Administrative controls (i.e., minimum staffing levels, required procedures, minimum operable equipment); • Workplace engineering controls (such as shielding, ventilation, alarms); • Use of emergency power for important aspects of the experiment (e.g., refrigerators, cold boxes, or operational equipment); • Required limits of the amount of toxic or hazardous experimental material to perform the experiment; • Quantity of nuclear material/fissionable materials/radioisotopes; • Facility limits/controls documented in the Facility Use Agreement (FUA).
Step 6	<p>As applicable, the PI/RP or ERC verifies that a NEPA review was conducted as required by the National Environmental Policy Act (NEPA) and Cultural Resources Evaluations Subject Area.</p>
Step 7	<p>The PI/RP and/or the ERC does the following:</p> <ul style="list-style-type: none"> • Ensures any design or modification of equipment or facilities (i.e., engineering calculations, drawings, or specifications) required by the experiment is prepared, revised, and reviewed according to the Engineering Design Subject Area; • If the experiment is using controlled substances, refers to the Using

	<p>Controlled Substances in Research Subject Area for requirements before acquiring the controlled substances;</p> <ul style="list-style-type: none"> • Works with the ECR, as necessary, to review their experiment if it has significant environmental aspects, as determined by applying the exhibit BNL Criteria for Significant Aspects in the Identification of Significant Environmental Aspects and Impacts Subject Area; • Ensures training requirements, associated with the hazards of the experiment, are discussed with the support staff responsible for maintaining the Department/Division Job Training Assessments (JTAs). See the Training and Qualifications Subject Area; • If the experiment will involve Nanomaterials, then refer to the Approach to Nanomaterial ESH interim procedure. • If the experiment will involve the transportation of hazardous materials, refers to the applicable transportation subject area (i.e., Transfer of Hazardous and Radioactive Materials On-site, Transportation of Hazardous and Radioactive Materials Off-site). • If the experiment is using any biological materials, refers to the Biosafety in Research Subject Area for requirements.
Step 8	<p>The ERC, working in conjunction with the Building Manager, determines if planned experimental activities impact the hazard classification, programmatic/quality issues, or safety/environmental envelope of the facility. Examples of this could be use of chemicals in quantities greater than state and federal regulation, addition of radioactive material in excess of what is already stated in the FUA, or other items, which would require a modification to the FUA. If so, the ERC works with the Building Manager to ensure the FUA is updated. See the Facility Use Agreement Subject Area for more information.</p> <p>Note: For major changes to the FUA (i.e., changes to the Operational Safety Envelope of the Facility), the FUA Change Analysis Document must be signed by the Deputy Director for Operations before the start of the experiment. (The FUA does not need to be posted on SBMS before starting the experiment).</p>

1.2 Experimental Safety Review Committee

Each Department/Division determines and establishes the appropriate implementation mechanisms (i.e., internal procedures, R2A2s) necessary to systematically ensure all proposed experiments and significant modifications to experiments are reviewed by an Experimental Safety Review Committee (or subcommittee) to ensure they are in compliance with this subject area.

The Experimental Safety Review Committee is responsible for reviewing experiments (and significant modifications to experiments) for the following:

- ES&H concerns;
- Ensuring appropriate controls for each experiment (during set-up, operations, and tear-down) are established;
- Recommending to the Department/Division approval or disapproval of the installation and/or operation of the experiment.

Generic controls may be established so that similar and routine/repetitive experiments do not need repetitive committee approval. The Department Chair/Division Manager or designee can approve these.

Step 1	<p>The Department Chair/Division Manager appoints members, with appropriate experience, to the Experimental Safety Review Committee (ESRC).</p> <p>The committee membership includes as a minimum the following:</p> <ul style="list-style-type: none"> • Experimental Review Coordinator (usually serves as chairperson); • Facility Support Representative; • Environmental Compliance Representative; • ES&H Coordinator. <p>Note: Additional SMEs, such as Industrial Hygienists and Industrial Safety staff, may be consulted on an ad-hoc basis, depending on the nature of the hazards (e.g., experimental work involving nanomaterials).</p>
Step 2	<p>The ERC, with the PI/RP, determines if a proposed or modified experiment requires an ESRC review.</p> <p>Note: If a proposed experiment falls within the controls and operational limits of a previously defined envelope or a previous experiment's safety review, then there is no need for a review.</p>
Step 3	<p>The PI/RP presents the Experimental Safety Review to the ESRC for review, comment, and concurrence.</p>
Step 4	<p>The ESRC determines if the Experimental Safety Review documentation is adequate enough to ensure a proper safety analysis of the experiment, i.e., are all the hazards, hazardous devices/processes identified and mitigated?</p> <p>Use the BNL Hazard Identification Tool and the exhibit ESH&Q Considerations when Designing an Experiment as guidance for making this determination.</p> <p>For help in analyzing environmental issues, see the Process Assessment Subject Area.</p>
Step 5	<p>If appropriate for the Department/Division, the ESRC determines if the experiment is within the Operational Safety Limits or Accelerator Safety Envelope established by any pertinent Safety Analysis Report or Safety Assessment Document/Accelerator Safety Envelope Document.</p>
Step 6	<p>The ESRC considers the potential for off-site impact from identified hazards.</p> <p>Note: The Checklist for Identifying Issues/Upcoming Decisions that May Require Community Involvement/Communications in the Community Involvement and Communications in Laboratory Decision-Making Subject Area can be used for guidance. If an impact is determined, the ESRC should complete the form and send it to the Community Involvement Office.</p>
Step 7	<p>If not already done, the ESRC determines if additional Laboratory review committees are required to review the Experimental Safety Review. Among</p>

	these committees are Laboratory Environmental Safety & Health, Laboratory Electrical Safety, BNL Institutional Review Board (Human Studies), Transportation Safety Working Group, Institutional Biosafety, BNL Radioactive Drug Research, Institutional Animal Care and Use, Integrated Security, and Counter-Intelligence.
Step 8	The ESRC documents the committees' review of the experiment in writing. Note: This documentation can be in the form of a new or amended Experimental Safety Review.
Step 9	The ESRC documents any appropriate inspections required, before operations, to confirm readiness of necessary hardware, systems, work controls, procedures, QA, and training.
Step 10	The ESRC recommends any Experimental Safety Reviews that may need further review by Subject Matter Experts in other Departments such as the Radiological Control Division (RCD), Waste Management Division (WMD), Environmental Services Division (ESD), and/or the Safety and Health Services Division (SHSD).
Step 11	The ESRC recommends to the Department Chair/Division Manager or designee whether to approve or disapprove the installation and/or operation of the experiment. The ESRC will define the appropriate controls/limits for the experiment as a condition of approval. Note: Depending on the hazards associated with the experiment, the ESRC may request to the Department Chair/Division Manager that the cognizant Associate Laboratory Director, or the Deputy Director for Operations, or both, approve the experiment. Note: If the ESRC recommends disapproval, then they should denote the reasons and any guidance given to the PI/RP on how to correct problems with the experiment or the Experimental Safety Review.
Step 12	The PI/RP performs and documents completion of any pre-start-up or post-start-up actions required by the ESRC. Note: Documentation of completed tasks should become part of the Experimental Safety Review package.
Step 13	The ERC or designee maintains the Experimental Safety Review documentation and any ESRC documentation or minutes according to the Records Management Subject Area.

1.3 Notifications to Other Departments/Divisions

By following subsections 1.1 and 1.2, the PI/RP and ERC ensure an experiment can be conducted safely. However, at times, it may be important to notify other Departments/Divisions about hazards associated with an experiment (or significant modification to an experiment). Fire Safety (Emergency Services), the Occupational Medical Clinic (OMC), and Safety & Health Services Division (SHSD) may need to be notified. These Departments/Divisions may use this notification as a method to concur on what precautions have been taken, to suggest

additional precautions, to prepare themselves to address potential experimental hazards, or for information only.

Step 1	<p>The PI/RP or ERC refers to the exhibit Department Notifications Table for suggested notifications.</p> <p>Note: The PI/RP or ERC may notify other Departments/Divisions of hazards associated with the experiment at any time.</p>
Step 2	<p>If the experiment causes a situation or condition that affects the building's Facility Use Agreement (see step 8 in subsection 1.1), the PI/RP or ERC informs the Building Manager.</p> <p>The Building Manager and ERC decide if other Departmental/Divisional notifications are required.</p>

1.4 Experimental Approval

The level of review and approval necessary for experiments depends on the severity of the hazards and consequences as dictated by DOE Orders and ES&H Standards. BNL relies on Experimental Review Coordinators (ERC) and Experimental Safety Review Committees (ESRC) to ensure that the appropriate Subject Matter Experts review the appropriate experiments. In all cases it is important that the PI/RP work closely with the ERC and ESRC to ensure full assessment and mitigation of hazards.

Laboratory "Line Management" has the ultimate responsibility for conducting experiments safely and in compliance with this subject area.

Step 1	<p>Unless the ESRC recommends a higher approval level, the Department Chair/Division Manager or designee approves the experiment. The ESRC and the Department Chair/Division Manager document their approval. (If used, the approval can be documented on the Experiment Safety Review Form, or equivalent).</p> <p>All approvals must be documented. The Experimental Safety Review must clearly state the</p> <ul style="list-style-type: none"> • Controls and limits of the experiment; • Expected time duration of the approval. <p>Note: Significant modifications (changes to the controls and limits already approved by the Department Chair/Division Manager) require a new review and approval before their implementation.</p> <p>Note: Even if the ESRC does not recommend higher approval authority, the Department/Division can require higher approval authority at any time.</p>
Step 2	<p>Approve engineering specifications, engineering drawings, engineering calculations, or associated design reviews/modifications to these types of documents according to the Engineering Design Subject Area.</p>

1.5 Operations

All PI/RPs and participating scientists must follow the guidelines and controls as stated in the approved Experimental Safety Review.

As stated in the previous subsection, Laboratory "Line Management" has the ultimate responsibility for conducting experiments safely. The Department Chair/Division Manager or designee has the authority to cease operation of any experiment at any time.

Step 1	The ERC/ESRC verifies that all pre-start-up conditions and requirements of the Experimental Safety Review are in place before the beginning of the experiment.
Step 2	The PI/RP (experimenters) operates the experiment within the terms, limits, and conditions established by the ESRC and approved by the Department/Division.
Step 3	<p>The PI/RP (experimenters) ceases operation of the experiment and performs mitigative actions if controls and limits, required to protect the environment or personnel safety, are exceeded. Report these situations to the Department Chair/Division Manager.</p> <p>Note: The experiment remains shutdown until the PI/RP can justify its restart to the Department Chair/Division Manager or designee.</p> <p>Note: If the circumstances involved radiological issues, then the Department Chair/Division Manager or designee informs the Facility Support Representative. They will determine if a Radiological Awareness Report is required.</p> <p>Note: As appropriate, the Department/Division will notify the Occurrence Categorizer to determine if the circumstances constitute a reportable event. See the Occurrence Reporting and Processing System (ORPS) Subject Area for more information.</p>
Step 4	The Department Chair/Division Manager or designee (ERC) routinely monitors experiments to ensure they are being operated as approved.
Step 5	The Deputy Director for Science and Technology periodically assesses Experimental Safety Review Processes.
Step 6	The PI/RP, Participating Scientists, ERC, ESRC, and Department Chair/Division Manager request feedback and look to identify opportunities for improvement of the Experimental Safety Review process. They feedback any pertinent information to the Department/Division self-assessment process, as well as the Work Planning & Control POC .

1.6 Review of Long-term Experiments

All long-term experiments, those experiments greater than one year in duration, must be reviewed annually. This review is conducted to ensure that the design and operation of the experiment has not changed since the most recent approval by the ESRC/ERC. Items to consider are controls and limits, hazards, scope of the experiments, and materials used. The ERC, ESRC, or both review significant modifications to experiments before their implementation.

Step 1	<p>The ERC/designee contacts the PI/RP to initiate the yearly review.</p> <p>Annual reviews focus on ensuring that the design and operation of the experiment has not changed since its last approval. This review ensures the design and operation is within its experimental safety review. This review may also include the addition of new items, which will take place in the following year.</p>
Step 2	<p>If modifications are planned on experiments, the ERC or designee reviews these modifications and determines if further review by the ESRC or other Laboratory Committees is required before implementation.</p> <p>Modifications are reviewed to</p> <ul style="list-style-type: none"> • Document the change for configuration control; • Ensure there is no need to change any controls and limits previously approved by the Department Chair/Division Manager. If changes to controls and limits are needed, a review by the ESRC is required as well as new approval by the Department/Division.
Step 3	<p>The PI/RP or ERC documents both the annual reviews and reviews of modifications. Document these by doing one of the following:</p> <ul style="list-style-type: none"> • Adding an amendment to the Experimental Safety Review (ESR); • Creating a new ESR; • Adding an attachment to the ESR; • Denoting on the existing ESR that nothing has changed. <p>Note: Until the Department/Division approves an updated Experimental Safety Review, the original ESR along with any letters, attachments, and amendments will make up the up to date ESR.</p>
Step 4	<p>If the PI/RP or ERC determines that the control and limits required to protect the environment or personnel safety are exceeded, then the experiment must be shutdown and the Department Chair/Division Manager informed.</p> <p>Note: The experiment remains shutdown until the PI/RP can justify its restart to the Department Chair/Division Manager or designee.</p> <p>Note: As appropriate the Department/Division will notify the Occurrence Categorizer to determine if the circumstances constitute a reportable event. See the Occurrence Reporting and Processing System (ORPS) Subject Area for more information.</p>
Step 5	<p>The Department/Division ensures any opportunities for improvement, identified in this review process, are incorporated into the process.</p>
Step 6	<p>The ERC and the Building Manager coordinate their efforts to upgrade the Facility Use Agreement (FUA) if needed. See the Facility Use Agreement Subject Area for more information.</p>

1.7 Experimental Termination

At the conclusion of an experiment, the experimental area must be left in a condition that is satisfactory to the host Department/Division.

Step 1	The PI/RP or participating scientist informs the host Department/Division's management, ERC, or Building Manager that the experimental activities will soon terminate.
Step 2	<p>The Department/Division or collaboration conducting the experiment provides the resources to remove the experiment from the space, and return the space to a condition that is acceptable to the host Department/Division.</p> <p>Removing the experiment includes the following:</p> <ul style="list-style-type: none"> • Disposing of radioactive, industrial, hazardous, and mixed wastes. See the following subject areas for more information: <ul style="list-style-type: none"> ◦ Hazardous Waste Management; ◦ Mixed Waste Management; ◦ Radioactive Waste Management; ◦ Regulated Medical Waste Management. • Disposing of or reusing chemicals (reconciling the chemical inventory). See the Working With Chemicals Subject Area for more information; • Tearing down and disposing of, or reusing experimental equipment. See the section on Work Planning and Control for Operations for more information; • Returning or replacing utilities. See the section on Work Planning and Control for Operations for more information; • Appropriate decontamination of the area; • Any type of area monitoring that may be required (i.e., lead, air, cadmium, Be, asbestos). <p>Note: The Work Control Manager/Coordinator of the host Department/Division may need to assist in coordinating this effort.</p>
Step 3	<p>As appropriate the Department/Division tracks experimental termination items to closure.</p> <p>Note: Depending on many variables (size, duration, and location of the experiment, the number of collaborators involved, the past performance of collaborators), the host Department/Division may wish to walkthrough and verify the condition of the area. If a walkthrough is performed, it may be documented on the Experiment Safety Review Form (or equivalent), if a review form was used, or a memorandum attached to the ESR.</p> <p>Note: If needed, a formal Exit Readiness Review may be conducted.</p>
Step 4	If required, the Building Manager updates the Facility Use Agreement (FUA). See the Facility Use Agreement Subject Area for more information.

1.8 Integrated Safety Management (ISM) Flowdown for Experimental Work

Before the Procurement and Property Management Division (PPM) issues a purchase order for experimental work to be performed on-site, the proposed work must be reviewed and approved by the facility Experimental Review Coordinator (ERC).

Step 1	The Requisitioner completes the ISM Flow down questions in the Web Requisition header (refer to the Web Requisition Process for the Work Planning and Control document on the Business Systems Division [BSD] home page).
Step 2	<p>If it is determined that only desk/paperwork is to be performed in an office environment, no further action is needed.</p> <p>If it is determined that experimental work is to be performed on-site, the Experimental Review Coordinator (ERC) for the Department/Division where the work will be performed must review and approve the web requisition before PPM issues the purchase order. This approval indicates the ERC's awareness of planned experimental work and ensures that experimental safety review requirements will be met.</p> <p>Note: For non-experimental work performed on-site, the Work Control Manager/Coordinator reviews the requisition in accordance with subsection 2.9 Integrated Safety Management Flowdown to Contractors and Suppliers.</p> <p>Note: For work performed off-site, refer to the section Off-Site Work for additional guidance.</p>
Step 3	Before experimental work can be performed on-site, an experimental safety review must be performed in accordance with subsection 1.1.

References

[Approach to Nanomaterial ESH](#) Interim Procedure

[Biosafety in Research](#) Subject Area

[BNL Hazard Identification Tool](#)

[Business Systems Division \(BSD\)](#) home page

[Community Involvement and Communications in Laboratory Decision-Making](#) Subject Area

[Engineering Design](#) Subject Area

[Facility Use Agreement](#) Subject Area

[Hazardous Waste Management](#) Subject Area

[Identification of Significant Environmental Aspects and Impacts](#) Subject Area

[Mixed Waste Management](#) Subject Area

[National Environmental Policy Act \(NEPA\) and Cultural Resources Evaluations](#) Subject Area

[Occurrence Reporting and Processing System \(ORPS\)](#) Subject Area

[Process Assessment](#) Subject Area

[Radioactive Waste Management](#) Subject Area

[Records Management](#) Subject Area

[Regulated Medical Waste Management](#) Subject Area

[Training and Qualifications](#) Subject Area

[Transfer of Hazardous and Radioactive Materials On-site](#) Subject Area

[Transportation of Hazardous and Radioactive Materials Off-site](#) Subject Area

[Using Controlled Substances in Research](#) Subject Area

[Working With Chemicals](#) Subject Area

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PROCEDURE: 2. WORK PLANNING AND CONTROL FOR OPERATIONS

Management System: Work Planning and Control		
Subject Area: Work Planning and Control for Experiments and Operations		
2. Work Planning and Control for Operations		
Effective Date: Oct 2, 2007	Subject Matter Expert: Christopher Johnson	Management System Steward: Michael Bebon

| [SBMS Home Page](#) | [Top of Subject Area](#) | [Instructions](#) | [Definitions](#) |

Applicability

This information applies to BNL and non-BNL staff who conduct work.

Required Procedure

Departments/Divisions may assign responsibilities and roles differently in their procedures versus the assignments indicated in this section. However, Departments/Divisions must ensure all responsibilities described in the steps are assigned to qualified people.

Work Planning and Control for Operations contains nine subsections:

- [2.1 Selection, Training, and Qualification for Work Control Managers and Coordinators](#)
- [2.2 Defining/Determining the Work Planning Level](#)
- [2.3 Prescribed Work Hazard Identification, Analysis and Controls](#)
- [2.4 Permit Planned Work Hazard Identification, Analysis and Controls](#)
- [2.5 Control of Work/Job Change Control](#)
- [2.6 Post Job Review, Feedback and Improvement](#)
- [2.7 Permit Planned Work Closeout](#)
- [2.8 Integrated Safety Management \(ISM\) Flowdown to Contractors and Suppliers](#)
- [2.9 Standing Work Permit](#)

2.1 Selection, Training, and Qualification for Work Control Managers and Coordinators

Step 1	The Department Chair/Division Manager appoints a Work Control Manager (WCM)
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	<p>to implement the work planning and control process for operations. When appointing a WCM, consider the following:</p> <ul style="list-style-type: none"> • Education: Degree in related field or equivalent experience; • Experience: Several years at BNL or equivalent experience at a DOE or related facility; • Functional Area Experience: <ul style="list-style-type: none"> ◦ Hazard identification and analysis; ◦ Application of requirements, standards, and regulations into work planning; ◦ Familiar with pre-job briefing and activity walk-down concepts; and ◦ Communication and writing skills.
Step 2	<p>The Department Chair/Division Manager or designee appoints Work Control Coordinators (WCCs) for each area or appropriate group within their Department/Division. When appointing WCCs, consider the following:</p> <ul style="list-style-type: none"> • Experience: Several years at BNL or equivalent experience at a DOE or related facility; • Functional Area Experience: <ul style="list-style-type: none"> ◦ Hazard identification and analysis within the assigned work environment; ◦ Application of requirements, standards, and regulations into work planning; ◦ Work screening requirements and knowledge of pre-job briefing and activity walk-down concepts; and ◦ Communication and writing skills.
Step 3	<p>After selections are made, assign the appropriate Brookhaven Training Management System (BTMS) WCM/WCC Job Training Assessments (JTAs) or Department/Division equivalent.</p> <p>Note: The general employees' JTAs establish the institutional training requirements. JTAs that address assigned work or facility-specific activities and hazards must be developed and assigned by Departments/Divisions, as appropriate.</p>
Step 4	<p>The Department Chair/Division Manager or designee must ensure that WCCs are qualified to perform work commensurate with operations and hazards in their Departments/Divisions. Requirements for qualifying them must include one of the following methods:</p> <ul style="list-style-type: none"> • On-the-job training (e.g., organizations' work planning procedure, work permit development and implementation, pre-job briefings); • Demonstration (i.e., identification of hazards associated with planned work, hazard mitigation, activity planning and implementation). <p>Forward a note to the Training and Qualifications Office to document the completion of the qualification.</p>

Step 5	The Department Chair/Division Manager or designee ensures that the Work Control Manager and Coordinator List is up to date.
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2.2 Defining/Determining the Work Planning Level

Step 1	<p>The Work Requestor provides a complete, accurate, and detailed description of the work or service required. For routine work or operations that are covered by a pre-approved work plan or a job-specific and approved procedure, go to the subsection Prescribed Work Hazard Identification, Analysis and Controls. The following information must be included with the description of work:</p> <ul style="list-style-type: none"> • Location of work to be performed; • Any special instructions, considerations, known area hazards, required training, and access requirements. <p>Note: For work performed off-site, refer to the section Off-site Work.</p>
Step 2	<p>Consider the following three factors when categorizing work requests into low-, moderate-, or high-hazard job categories:</p> <ul style="list-style-type: none"> • ESS&H Issues; • Complexity; • Work Coordination. <p>The WCC screens the requested job/work to determine ESS&H risk level, complexity, and work coordination levels. If the job being screened could affect experimental operations, impact the hazard classification or safety envelope of the facility, or may require changes to the Facility Use Agreement, the WCC consults with the appropriate personnel.</p>
Step 3	<p>The WCC uses the Department/Division's work description documentation, Screening Guidelines for Work Permit Determination exhibit and the Application of the Graded Approach exhibit in the Graded Approach for Quality Requirements Subject Area to aid in determining the work planning mode. See the Work Planning and Control Operations Flowchart.</p> <p>Place the work request into low-, moderate-, or high-hazard categories using a graded approach.</p> <ul style="list-style-type: none"> • If the work screened is rated as a low hazard, the work can be planned using the planning modes in the section Worker Planned Work and the subsections Prescribed Work Hazard Identification, Analysis and Controls or Permit Planned Work Hazard Identification, Analysis and Controls. • If the work screened is rated as moderate- or high-hazard, a prescribed work document or work permit is required (refer to subsection Prescribed Work Hazard Identification, Analysis and Controls or Permit Planned Work Hazard Identification, Analysis and Controls planning modes. See the exhibit Examples of Low, Moderate, and High Tasks.

Note: Even though it is not required to document the decision to rate a task as low hazard, this is one method for the Department/Division to evaluate worker planned work tasks. Another method would be to generate a low-hazard work permit and use it as documentation in the future.

Note: Others in the process can request that a work permit be used to perform a task any time.

2.3 Prescribed Work Hazard Identification, Analysis and Controls

The “Prescribed Work” mode of work relies on prescribed work documents that are a formal set of instructions or guidelines (e.g., standard operating procedure, contractor health and safety plan, contractor procedure, operating/maintenance manual) for how to perform the work.

The goal of prescribing the way the work will be performed is to control the work so that the levels of hazard, complexity, and coordination are low.

Step 1	Line Management ensures a formal set of prescribed work documents are approved and meet the requirements of relevant subject areas.
Step 2	<p>The Lead Reviewer, Supervisor or designee either follows the Internal Controlled Documents Subject Area or reviews the prescribed work document(s) to determine the following:</p> <ul style="list-style-type: none"> • Access requirements for the area where the work will be performed; • Any special instructions or considerations that may be applicable; • The person authorized to start the proposed work, and whether additional work start authorizations are needed before starting work; • Verification that the prescribed work document fully and accurately addresses the scope of work to be performed; • Training requirements, the hazards associated with the job, and the controls necessary to prevent accidents, injuries, and environment or property damage. <p>Review prescribed work documents against job risk assessments (JRAs)/facility risk assessments (FRAs) and facility use agreements to ensure that all the hazards have been identified and controlled, and that the proposed work does not affect experimental operations, or impact the hazard classification or safety envelope of the facility.</p> <p>Note: If a JRA or FRA does not exist for the work scope, notify the OSH Management System Representative or designee to assist in developing a JRA.</p>
Step 3	<p>The Lead Reviewer, Supervisor, or designee verifies that hazard control methods described in the prescribed work document are based on the following hierarchy, when practical:</p> <ul style="list-style-type: none"> • Elimination/substitution of hazards; • Engineering controls;

	<ul style="list-style-type: none"> • Administrative controls and work practices; and/or • Personal protective equipment (PPE). <p>Note: Staff can request that the proposed work be performed under permit planned work, or re-evaluation of task hazards, if they feel there are location hazards, changes at the job site, hazards not previously identified, and/or job complexity issues that need to be addressed (even if the task is rated low). They contact their supervisor, who will work with the appropriate Work Control Coordinator or subject matter expert to address concerns.</p>
Step 4	<p>After the Lead Reviewer, Supervisor or designee concludes that the work is adequately planned and appropriate hazard controls are in place and addressed by the prescribed work document, the Lead Reviewer, Supervisor or designee conducts pre-job safety briefing with the work crew to review pre-planned work document precautions, pre-requisites, job hazards, and/or work coordination. Consider the following at the pre-job briefing:</p> <ul style="list-style-type: none"> • What are the hazards associated with the work? And are they properly controlled? • What are the critical steps to complete this work safely? • What is the worst thing that can go wrong? And how can we make a mistake at that point? • Has the affected Department/Division Building Manager or designee been notified and authorized the start of the job? • What actions are taken if new hazards are identified? <p>Note: As work progresses, sometimes it may not go as originally planned, e.g., experiencing false starts, new hazards are introduced, a staff member sees an unsafe act, activity, or a condition that creates imminent danger. The staff member can exercise Stop Work authority. See the Stop Work Subject Area.</p> <p>Note: Additional crew members arriving on the job after the original briefing must also be briefed before they can start work.</p>
Step 5	<p>Work within the established controls.</p> <p>Note: If the authorized work is not progressing as planned, or new hazards are introduced, initiate stop work authority if imminent danger exists, or take a time out to re-evaluate the work. Refer to the subsection Control of Work/Job Change Control.</p>
Step 6	<p>At the completion of work, the Supervisor, WCC/WCM, Worker, or Task/activity Leader</p> <ul style="list-style-type: none"> • Ensures the work site is left in a clean and safe condition. • Obtains feedback from the workers, and/or provides feedback to their supervisor, building manager, or work requestor. <p>Note: Refer to subsection Post Job Review, Feedback and Improvement.</p>

2.4 Permit Planned Work Hazard Identification, Analysis

and Controls

The Work Permit Form is a means for each Department/Division to control moderate- and high-hazard work. It may also be used for low-hazard work as an aid in coordinating the effort. The form, which was designed around the ISM five Core Functions, provides work information and plans, ESS&H checklist items, the proper reviews, and a mechanism for worker involvement and feedback. Additional safety permits, work instructions, and drawings are attached to the work permits as needed.

Note: Work permits may not be required to stabilize emergency situations. However, the need for proper hazard recognition, use of ESS&H principles, job planning, and notifications of facility personnel are still required. Once the situation is stabilized, the work planning process (this section) will apply.

Step 1	<p>The WCC records the job information (i.e., date, work permit number, and short description of the activity) into the Work Permit Logbook or spreadsheet.</p> <p>The WCC or Work Requester/designee generating the work permit, completes the Work Permit Form or Electronic Work Permit in accordance with the Instructions for Filling out the Work Permit.</p>
Step 2	<p>The Work Requester or designee meets with or sends the work information to the service provider. This information helps the service provider in planning the job.</p> <ul style="list-style-type: none"> • The Work Requester or designee and/or service provider review previous work permits and/or lessons learned associated with the work to be performed (i.e., BNL Lessons Learned, DOE Lessons Learned Database). This information should be used to identify potential hazards and/or good work practices. • Note: If a JRA or FRA does not exist for the work scope, notify the OSH Management System Representative for the Department/Division requesting the work to assist in developing a JRA.
Step 3	<p>In accordance with the Instructions for Filling out the Work Permit, the WCC selects the Walk Down Team members.</p>
Step 4	<p>The Walk Down Team does the following:</p> <ul style="list-style-type: none"> • Visits the job site; reviews the impact to experimental operations, hazard classification or safety envelope of the facility, or to the Facility Use Agreement. The WCC consults with the appropriate personnel, as needed. • Ensures ESS&H issues and work controls on the permit are adequate for mitigating identified hazards, and that hazard controls are based on the following hierarchy, when practical: <ul style="list-style-type: none"> ◦ elimination/substitution of hazards; ◦ engineering controls; ◦ administrative controls and work practices; and/or ◦ personal protective equipment (PPE). • Agrees on the final ESS&H risk, Complexity and Work Coordination levels (low, moderate, or high) for the proposed work. <p>Note: The Application of the Graded Approach exhibit in the Graded Approach for</p>

	<p>Quality Requirements Subject Area should be used to assist in determining the ESS&H rating.</p>
Step 5	<p>The Work Requestor or designee develops a work plan in accordance with section 3 of the Instructions for Filling out the Work Permit.</p> <p>The work plan should contain the following, as applicable:</p> <ul style="list-style-type: none"> • A detailed description of the work; • Prerequisites/Precautions: preparatory actions to be performed before work can be started and any administrative and physical requirements, and precautions that should be observed during performance of work; • Directions: steps that define how to do the work and that also identify those responsible for doing each task; • Identification for industrial hygiene hold points and other monitoring; • Hazard controls and mitigation strategies and/or operational limits imposed; • Post Work Testing: guidance concerning post work testing to ensure proper completion of work and/or system readiness to return to service. <p>Note: As an alternative, work instructions may be documented in an approved internal or standard operating procedure, or referenced procedures that may be attached to do the work.</p>
Step 6	<p>The WCC or designee forwards the Work Permit to the Department/Division's Primary Reviewer(s) for review and approval. The Primary Reviewer and Review Team review the work permit in accordance with the Instructions for Filling out the Work Permit.</p> <p>Note: The Department/Division designates the Primary Reviewer. The Primary Reviewer's signature means that the hazards and risks that could impact ESS&H have been identified, a walk down was completed, and the hazards will be controlled according to BNL requirements. The Primary Reviewer or designee must be a member of the Walk Down Team.</p>
Step 7	<p>After the Review Team concludes that the work is adequately planned, each team member signs off in "The Reviewed By" (i.e., ESS&H Professional, Work Control Coordinator, Building Manager, and Service Provider, as appropriate. It is preferred that the primary reviewer provide the final review)</p> <p>Note: Reviewing work permits in a team setting is encouraged, as opposed to circulating the permit for review and sign-off in series. The team environment is more effective in ESS&H reviews and in coordinating the required resources.</p>
Step 8	<p>The Primary Reviewer forwards the work permit and supporting documents (if applicable) to the WCC or designee.</p>
Step 9	<p>The WCC or designee conducts a pre-job briefing with the work crew to review job hazards, permits, and/or work coordination requirements. Consider the following at the pre-job briefing:</p> <ul style="list-style-type: none"> • What are the hazards associated with the work? And are they properly controlled? • What are the critical steps or phases to complete this work safely?

	<ul style="list-style-type: none"> • What is the worst thing that can go wrong? And how can we make a mistake at that point? • Have all the necessary permits been obtained and completed, and permit conditions have been met? • What actions are taken if new hazards are identified? <p>Note: Additional crew members arriving on the job after the original briefing must also be briefed before they can start work.</p>
Step 10	<p>After the pre-job briefing is completed, the Job Site Supervisor and Workers sign Section 4 of the work permit, or an attached sign-off list, indicating they understand the hazards, controls, and work permit requirements before they start working.</p> <p>Note: The Workers must sign for themselves; it is not permissible for the Job Site Supervisor to sign for the workers.</p>
Step 11	<p>The Department/Division Line Manager or designee authorizes work to be performed within the established controls. The person signing section 5 on the work permit indicates line manager responsibility for ESS&H.</p> <p>Note: The work authorization (e.g., work permit, permits, procedures, and/or work instructions) must be at the job site.</p>
Step 12	<p>Work within the established controls. At the completion of work, refer to the subsection Post Job Review, Feedback and Improvement.</p> <p>Note: If the authorized work is not progressing as planned, or new hazards are introduced, take time out to re-evaluate the work. Refer to the subsection Control of Work/Job Change Control. If imminent danger exists, stop work. See the Stop Work Subject Area.</p>

2.5 Control of Work/Job Change Control

This subsection describes the process for controlling work and job change control.

Step 1	The WCCs, Supervisors or designees ensure work is conducted according to the approved work plans, work instructions, and permits. Workers must work within the limits of the guidelines provided in the work authorization document (i.e., worker planned, prescribed or work permit documentation permit).
Step 2	<p>If at any time while working, the planned work changes and a problem/situation or additional hazards are identified:</p> <ul style="list-style-type: none"> • If imminent danger exists, issue a Stop Work Order. See the Stop Work Subject Area. • If radiological work does not meet Laboratory requirements, or could result in an exposure/release of radioactive material, issue Radiological Stop Work. See the Radiological Stop Work Subject Area. • Inform the Job Site Supervisor, Building Manager, or Work Control Coordinator as appropriate.

	<p>Note: If the work interruption was due to an incident, then refer to the Event/Issues Management Subject Area.</p>
Step 3	<p>The WCCs, Supervisors or designees evaluate concerns to determine if additional or different work methods are required to complete the job/work. They must consider the following:</p> <ul style="list-style-type: none"> • Put a temporary hold on the work; • Identify/implement additional hazard controls/mitigation strategies; and/or • Consult with the Walk Down/Review Team, Workers, Building Manager and subject matter experts, as appropriate to amend the work documents (e.g., work plan, permit, experimental safety review, job risk assessment or work instructions). <p>Note: If actions were not taken, WCCs, Supervisors or designees should communicate those reasons to staff doing the work.</p>
Step 4	<p>If necessary, amend the work authorization document(s) and conduct a job briefing to inform personnel of new hazards identified, mitigation controls, and training requirements.</p> <p>Note: The WCC, Supervisor or designee should verify that training/qualification requirements are met before re-authorizing work to proceed.</p>
Step 5	<p>Job Site Staff/Workers sign the revised work authorization document, or an attached sign-off list, indicating they understand the new hazards and/or change in work authorization requirements before they start work.</p> <p>Note: The Workers must initial and date next to their original signature, or sign for themselves; it is not permissible for the job supervisor to initial or sign for the workers.</p>
Step 6	<p>The affected Department/Division Line Manager or designee, sign-off on and re-issue the work authorization document and authorize the job/work/activity to proceed.</p> <p>Note: The Line Manager or designee who originally authorized the start of work must initial and date next to their original signature.</p>

2.6 Post Job Review, Feedback and Improvement

An important element in the Work Planning and Control process is worker feedback. Feedback can be received and distributed in many ways. Some examples are the following:

- Sections of the Work Permit;
- Pre-job briefings and walk downs;
- Post-job critiques/briefings;
- Safety meetings;
- Safety bulletins;
- Tool box meetings;
- Work in progress reviews;
- Standard operating procedure changes (after workers have reviewed them);
- Lessons learned memorandums.

Step 1	<p>At the completion of work, the WCC, Supervisor or designee performs a post-job review, as appropriate:</p> <ul style="list-style-type: none"> • Verifies that the work/job is complete, and that it meets the specifications established in the work authorization document(s). • Ensures the work site is left in a clean and safe condition. • Obtains feedback from the workers, and provides feedback to the work requestor and/or Department/Division. <p>Note: It is acceptable for the job supervisor to verify that the area has been returned to an acceptable condition and inform the WCM/WCC of the status.</p>
Step 2	<p>The WCC or designee reviews the work/job performance by asking Workers, Primary Reviewer, and/or Supervisor/Managers, as appropriate the following:</p> <ul style="list-style-type: none"> • Were there any surprises? Was the task accomplished with expected results? • Were procedures (or work authorization documentation) accurate? • Were planning and scheduling optimized to reduce the potential for human error? • Were job-site resources and information sufficient? • Was training for the job appropriate? • Were any lessons learned from this job?
Step 3	<p>The WCC or designee</p> <ul style="list-style-type: none"> • Documents any feedback or pertinent information generated during the review of the work; • Determines if facilities or work practices need to be changed as a result of worker feedback; • Determines if the feedback should be incorporated into the BNL Lessons Learned Program. <p>Note: Consult with the Department/Division Lessons Learned Coordinator for distributing feedback to other organizations.</p>
Step 4	<p>If the work was performed using a job or facility risk assessment, work instruction, pre-approved work plan, or standard operating procedure, the WCC or designee reviews the feedback to determine if the documentation was adequate, or should be revised to include improved processes.</p> <p>Feedback incorporated into the Department/Division processes should be documented and tracked to closure, as appropriate.</p>

2.7 Permit-Planned Work Closeout

Step 1	<p>The WCM/WCC reviews the work permit for completeness; signs Section 7 of the work permit (closeout); and ensures that administrative and operational closeouts are performed (i.e., equipment histories updated, configuration/drawing changes, operations is notified, as specified in the work permit).</p>

Step 2	<p>The WCM or WCC retains the completed work permit.</p> <p>File work permits according to the Records Management Subject Area. Moderate- and High-hazard Permits are kept for 75 years.</p>
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2.8 Integrated Safety Management (ISM) Flowdown to Contractors and Suppliers

Before the Procurement and Property Management Division (PPM) issues a purchase order for contractor, supplier, or warranty services to be performed on-site, the proposed work must be reviewed for Integrated Safety Management (ISM) requirements and determination if a work permit and/or health and safety plan is required.

Step 1	<p>The Requisitioner completes the ISM Flowdown questions in the Web Requisition header (refer to the Web Requisition Process for Work Planning and Control document on the Business Systems Division [BSD] home page).</p>
Step 2	<p>If it is determined that only desk/paperwork is to be performed in an office environment, no further action is needed.</p> <p>If it is determined that non-experimental work (other than construction) is to be performed on-site, the WCM/WCC for the Department/Division where the work will be performed reviews the web requisition for work planning and control.</p> <p>For construction work performed on-site, a construction-qualified Work Control Coordinator reviews the web requisition for work planning and control. No further action is required by this subject area. Refer to the Construction Safety Subject Area for the procedures to be followed.</p> <p>If it is determined that experimental work is to be performed on-site, the Experimental Review Coordinator (ERC) reviews the requisition in accordance with the subsection Integrated Safety Management (ISM) Flowdown for Experimental Work. No action is needed by the WCM/WCC.</p> <p>Note: For work performed off-site, refer to the section Off-site Work.</p>
Step 3	<p>The WCM/WCC screens the proposed work to determine the hazards and controls for the work to be performed on-site by following the subsection Defining/Determining the Work Planning Level.</p> <p>If the work screening determines that a work permit is required and the work is NOT high ESS&H risk level, high coordination, or high complexity level, the WCM/WCC indicates on the web requisition that a work permit is required and approves the requisition.</p> <p>The WCM/WCC processes the work permit in accordance with subsection Permit Planned Work Hazard Identification, Analysis and Controls before the contractor or supplier performs work on-site. Additionally, in consultation with the Environment, Safety, and Health (ESH) Coordinator, Training Coordinator, and Facility Support</p>

	<p>Representative, determine BNL site-specific training requirements and safety instructions for contractors and suppliers. Refer to the section Contractor/Vendor Training Processes of the Training and Qualifications Subject Area for more information.</p> <p>Note: As a minimum, the contractor's signature on the work permit serves as written acknowledgement of the hazards identified and controls specified in the work permit.</p> <p>For high ESS&H risk level, high hazard, high coordination, or high complexity level work, go to step 4; otherwise no further action is required.</p>
Step 4	For work determined to be high ESS&H risk level, high coordination, or high complexity level ("high"), the WCM/WCC, in collaboration with a BNL Safety Engineer, must complete the Contractor Health and Safety Plan (HASP) Checklist . The Safety Engineer must attach the completed checklist to the Web Requisition before submitting it to PPM.
Step 5	Before "high-risk, high-complexity or high-coordination" work can be performed on-site, the contractor or supplier must develop a Health and Safety Plan (see the Contractor Health and Safety Plan [HASP] Template) in accordance with the contractor Health and Safety Plan Checklist requirements, and submit it to the BNL Safety Engineer.
Step 6	The BNL Safety Engineer, WCM/WCC, and Contract Technical Representative review and approve the completed contractor or supplier Health and Safety Plan. The WCM/WCC retains the original, and a copy is sent to the Contract Administrator.
Step 7	The WCM/WCC processes the work permit in accordance with subsection Permit Planned Work Hazard Identification, Analysis and Controls before the contractor or supplier works on-site.

2.9 Standing Work Permit

A Standing Work Permit can be used as a longer-term hazard analysis and work authorization tool for jobs where the ESS&H concerns are static and the activities are repetitive. The organization issuing the Standing Work Permit processes the form by following these steps.

Standing work permits must be developed in accordance with the subsection [Permit Planned Work Hazard Identification, Analysis and Controls](#).

Step 1	<p>The WCC or Work Requester or designee, generating the work permit, completes the Work Permit Form in accordance with the Instructions for Filling out the Work Permit.</p> <p>Check off the Standing Work Permit box at the top right part of the Work Permit Form. The "start" and "end" dates in Section 1 of the work permit are the duration of the standing permit. The duration can only be for one year; then the permit must be reissued.</p>
Step 2	The person generating the Standing Work Permit ensures the workers are briefed and gets their signatures in Section 4, or on an attached sheet. Their signatures are good for the duration of the permit (not to exceed one year).

	<p>Note: The original Standing Work Permits should be kept with the Department/Division Work Control Manager. A copy of the permit may be used in the field.</p> <p>Note: If you are writing repetitive standing work permits for work within your work area or group, then you should consider writing a Standard Operating Procedure.</p>
Step 3	Before the start of work each time the Standing Work Permit is used, conduct a pre-job briefing, and authorize the start of work in accordance with subsection Permit Planned Work Hazard Identification, Analysis and Controls , step 9.

Guidelines

When working in work planning and control for operations areas (often this is in support of experimental work), use the following as general guidance for classifying work.

Guidance in determining low-hazard work: Routine work by the craft, technical, and/or scientific personnel, for which the ESS&H risks, complexity and coordination are all considered low, is classified as low-hazard work. This work classification, requiring minimum documentation (i.e., no requirement to use a Work Permit Form), is based on the concepts of "Worker Planned Work" and is supported by the level of experience, qualifications, and training.

Guidance in determining moderate-hazard work: Nonroutine work and routine work, for which none of the ESS&H risks, complexity, and coordination are considered high, but at least one is considered moderate, is classified as moderate-hazard work.

Guidance in determining high-hazard work: Nonroutine work, and routine work, for which at least one of the ESS&H risks, complexity, and coordination is considered high, is classified as high-hazard work.

See the exhibit [Examples of Low-, Moderate-, and High-rated Tasks](#) for additional guidance.

As previously stated, work in the low-hazard classification does not require use of a Work Permit Form; however, the form may still be used. Work in the moderate- and high-hazard classifications requires levels of planning, documentation, and control appropriate for the specific ESS&H risks, work complexity, and coordination.

References

BNL [Lessons Learned](#)

[Brookhaven Training Management System \(BTMS\)](#)

[Business Systems Division \(BSD\)](#) home page

[Construction Safety](#) Subject Area

[Department/Division Work Control Managers and Work Control Coordinators](#) Web Site

[Electronic Work Permit](#)

[Event/Issues Management](#) Subject Area

[Graded Approach for Quality Requirements](#) Subject Area

[Radiological Stop Work](#) Subject Area

[Records Management](#) Subject Area

[Stop Work](#) Subject Area

[Training and Qualifications](#) Subject Area

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PROCEDURE: 3. WORKER PLANNED WORK

Management System: Work Planning and Control		
Subject Area: Work Planning and Control for Experiments and Operations		
3. Worker Planned Work		
Effective Date: Oct 2, 2007	Subject Matter Expert: Christopher Johnson	Management System Steward: Michael Bebon

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Applicability

This information applies to BNL and non-BNL staff who conduct work.

Required Procedure

The "Worker Planned" work concept recognizes the capabilities of the workforce. The personnel may have the skill level and technical capabilities to handle a wide variety of jobs with minimum documentation and no direct supervision. Department/Divisions formally separate work rated as low-hazard from moderate- and high- hazard work. Work rated as low hazard may be considered worker planned work.

Facility Line Management ensures a work authorization process is in place, all hazard controls are in place, and hazard control methods were used based on the following hierarchy:

- Elimination/substitution of hazards;
- Engineering controls;
- Administrative controls and work practices; and/or
- Personal protective equipment (PPE).

This hierarchy is a pre-condition for worker planned work.

Each Department/Division determines the appropriate training requirements for the staff in their organization. Each Department/Division justifies the worker planned requirements for performing work rated as low-hazard within BNL Environment, Safety, Security, and Health (ESS&H) boundaries.

Step 1	Line management selects one or more of the following or equivalent methods for documenting training and skill level required for workers:
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	<ul style="list-style-type: none"> • Job Training Assessments; • Job Risk Assessments (JRA) for task hazards; • Qualification Matrix exhibit; • Letters to file, training records from other sites, and documented level of expertise (degree, certification, license, resumes, etc). <p>Line management determines if a relevant JRA exists. If a JRA does not exist for the task, notify the Department/Division OSH Management System Representative or designee to assist in developing a JRA.</p>
Step 2	<p>The worker (technician, operator, scientist, etc.)</p> <ul style="list-style-type: none"> • Plans the work; • Identifies the hazards and appropriate hazard controls to be used; • Determines that he or she has the training required to perform the job; and • Ensures that the work is authorized to begin.
Step 3	<p>Workers always consider the following before starting work and while working:</p> <ul style="list-style-type: none"> • What are the hazards associated with the work, and are they properly controlled? • What are the critical steps to complete this work safely? • What is the worst thing that can go wrong? • What errors could occur and what can be done to avoid them? • Are conditions appropriate for work to proceed? • What actions are taken if new hazards are identified? <p>A worker should stop work if at any time he or she is unsure of any of the above questions.</p> <p>When any staff member sees an unsafe act, activity, or condition that creates imminent danger, he or she exercises Stop Work authority. See the Stop Work Subject Area.</p> <p>Note: Staff can request that the proposed work be performed under permit planned work, or re-evaluation of task hazards, if they feel there are location hazards, changes at the job site, hazards not previously identified, and/or job complexity issues that need to be addressed (even if the task is rated low). They contact their supervisor, who will work with the appropriate Work Control Coordinator or subject matter expert to address concerns.</p>
Step 4	<p>Work within the established controls. If the authorized work is not proceeding as planned, or new hazards are introduced or identified, re-evaluate the work or initiate stop work authority if imminent danger exists.</p>
Step 5	<p>At the completion of work, the worker</p> <ul style="list-style-type: none"> • Ensures the work site is left in a clean and safe condition; • Provides feedback to their manager, supervisor, work requestor, or appropriate subject matter expert.

Note: Refer to subsection [Post Job Review, Feedback and Improvement](#).

References

[Stop Work](#) Subject Area

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PROCEDURE: 4. WORK OBSERVATIONS

Management System: Work Planning and Control		
Subject Area: Work Planning and Control for Experiments and Operations		
4. Work Observations		
Effective Date: Oct 2, 2007	Subject Matter Expert: Christopher Johnson	Management System Steward: Michael Bebon

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Applicability

This information applies to BNL line management.

Required Procedure

Each Department/Division must conduct work observations of their work planning and control practices for experiments and operations. To enhance safety in the workplace line management must observe work and learn how the worker has integrated safety into daily activities. This is meant to be an evaluation of the BNL Work Planning and Control processes, the communication of these practices to the worker, and any impediments that might influence the worker away from performing the work as required. The work observations can identify problems, areas of excellence, and lessons learned that would continually improve BNL Integrated Safety Management processes.

Step 1	The Department/Division line manager determines the time frame, scope, and resources necessary to conduct work observations. The scheduling of work observations should be based on the priorities of each Department/Division.
Step 2	<p>The Work Control Manager, Experimental Review Coordinator or designee divides observations into the following categories:</p> <ul style="list-style-type: none">• Positions of People;• Ergonomics;• Clothing and Personal Protective Equipment;• Tools and Equipment;• Procedures;• Orderliness.

Step 3	<p>Observe employee/worker first, and then contact and open discussion with the employee/worker. The contact and open discussion should include:</p> <ul style="list-style-type: none"> • Comment on safe behavior; • Consequences of unsafe act; • Safer ways to do the job; • Agreement to work safely; • Thanking the employee. <p>The Department/Division must ensure that changes identified to improve the planning process, experiment safety review process, and the safe conduct of experiments are continually fed back into the review process. This should include lessons learned from observations.</p>
Step 4	<p>During the safety observation discussion with the employee/worker on the work observation, the Line Manager should use some of the following safety questions, as appropriate:</p> <ul style="list-style-type: none"> • What energy/hazards are present? • Are employees, supervisors, and work planners aware of the hazards? • What part of your job concerns you? • What training/knowledge is needed to do the task safely? • Why do people get hurt? • What is the safety climate here? • What are our standards for safety (intended & actual)? • How are our Safety Management Systems working? • What needs to be improved here? • Where are the Danger Zones? • What did the Task Briefing and/or pre-job walk down cover? • Do you feel you have adequate tools for the job?
Step 5	<p>Document the work observation in the BNL Safety Observation Database. If there were any lessons learned during the observation, contact the Work Control Manager or Experiment Review Coordinator as appropriate.</p>
Step 6	<p>The Work Control Manager or Experiment Review Coordinator sends any lessons learned generated from the work observations to the Lessons Learned Coordinator.</p>

References

[BNL Safety Observation Database](#)

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PROCEDURE: 5. OFF-SITE WORK

Management System: Work Planning and Control		
Subject Area: Work Planning and Control for Experiments and Operations		
5. Off-site Work		
Effective Date: Oct 2, 2007	Subject Matter Expert: Christopher Johnson	Management System Steward: Michael Bebon

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Applicability

This information applies to all Departments/Divisions that send their staff off-site to conduct assigned work.

Required Procedure

This section discusses the requirements associated with the actual work itself taking place off-site, not items such as reimbursement, authorization to travel, advances, reservations, or sensitive countries. For information on these items, see the [Domestic Travel](#) Subject Area and the [Official Foreign Travel](#) Subject Area. This section also provides guidelines for work at different locations off-site.

Step 1	Use the exhibit Guidance in Conducting Off-Site Work to help determine how to approach tasks at different work sites.
Step 2	BNL staff conducting work at an off-site laboratory or industrial company follow the procedures and safety requirements of that organization supplemented by BNL procedures and processes.
Step 3	If the off-site work requires a Radiological Work Permit (RWP) and the laboratory or industrial company does not have a RWP procedure, then the lead BNL person generates an RWP according to the Radiological Control Procedures . Note: If the laboratory or industrial company does have their own RWP procedure, then follow their requirements.
Step 4	If any BNL worker on an off-site assignment needs to ship hazardous materials from that off-site location to BNL, or from BNL to that location, then he/she complies with the requirements in Transportation of Hazardous and Radiological Materials Off-site Subject Area.

Step 5	If the work taking place off-site is not performed within the confines or jurisdiction of an Industrial Facility or Laboratory Environment (e.g., drilling a sample well outside Laboratory boundaries or a marine study in Long Island Sound), then a Work Control Coordinator screens it according to the section Worker Planned Work to determine work planning requirements. If the task is an experiment, then go to step 7. Note: If the work is classified as "Worker Planned Work" or covered by a Standard Operating Procedure/Interim Operating Procedure, there is no need to screen the activity.
Step 6	If a work permit is required, then the Work Control Coordinator and the staff conducting the work, follow the section Work Planning and Control for Operations .
Step 7	The Experiment Review Coordinator reviews the proposed experiment to determine if an Experiment Safety Review should be written. If a review is required, then follow the requirements in the section Experimental Safety Review .

References

[Domestic Travel](#) Subject Area

[Official Foreign Travel](#) Subject Area

[Radiological Control Procedures](#)

[Transportation of Hazardous and Radiological Materials Off-site](#) Subject Area

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DEFINITIONS

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Definitions: Work Planning and Control for Experiments and Operations

Effective Date: **Oct 02, 2007**

Point of Contact: [Christopher Johnson](#)

Term	Definition
ALARA	The approach to radiation protection to manage and control exposures (both individual and collective) to the work force and to the general public, to levels as low as is reasonable, taking into account social, technical, economic, practical, and public policy considerations. ALARA is a concept and a process that has the objective of attaining (and maintaining, if achieved) doses as far below the applicable limits of 10CFR835 as reasonably achievable.
basic research	Research that is conducted to acquire and disseminate new knowledge of a theoretical/experimental nature; it does not lend itself to the establishment of predetermined results.
bench top research	Research conducted in a laboratory environment where the researcher has over-all control of the experimental apparatus (i.e., there is no need to communicate between the researcher and a facility operator).
construction work	Work that includes alteration, repair, demolition, remediation, erection, dismantling, painting, moving of buildings or other structures, hoisting or rigging in support of the aforementioned, land clearing, and excavating.
controls and limits	<p>A specific set of criteria established for an experiment. They can include both physical and administrative items. They are clearly stated in the Experimental Safety Review, or referenced by the use of other procedures, in the Experimental Safety Reviews. Collectively they define the boundaries (safety envelope) by which the experiment must be operated.</p> <p>Note: Typically control and limits should be reserved for controlling situations that involve moderate or high risk of injury or significant property damage.</p>
desk/paperwork	Paperwork or computer-related work performed at a desk in an office environment. Typically includes work at a computer station,

	<p>management, administrative services, data entry, information gathering, filing, and clerical activities.</p> <p>Note: Repair and warranty work associated with copy machines is not considered desk/paperwork.</p>
experiments	Processes and preparations necessary to conduct nonroutine tests or investigations of physical phenomena using equipment, materials or energy.
Experimental Review Coordinator (ERC)	Assigned by the Department Chair/Division Manager. The ERC is the person (or persons) within the Department/Division who assists the Principal Investigator/Responsible Person in generating Experimental Safety Reviews and also coordinates the review of experiments. ERCs are members of the Experimental Safety Review Committee (ESRC). The ERC serves as the interface between the operational groups and the experimental groups, and the ESRC and the experimental groups.
Experimental Safety Review Committee (ESRC)	<p>A Departmental/Divisional level committee with the responsibility for reviewing experiments (and significant modifications to experiments) for the following:</p> <ul style="list-style-type: none"> • ES&H concerns; • Ensuring appropriate controls for each experiment (during set-up, operations, and tear-down) are established; • Based upon ES&H concerns, recommending to the Department/Division approval or disapproval. <p>Some Departments/Divisions may already have existing committees or committees with multiple responsibilities that may also perform the Experimental Safety Review. There is no need to change the make up or names of these committees; however, for consistency, ESRC will be used in this Subject Area. In cases where the scope and hazard levels are sufficiently low, an appropriately sized subcommittee of the ESRC may be used.</p>
external work	Work that is performed by BNL or Non-BNL staff who are external to the facility or organization; these individuals are not as familiar with location hazards.
facility risk assessment	Some hazards may arise from activities or tasks not associated with a specific job. The facility itself and its general operations present certain exposures to hazards, e.g., electrical equipment, access and egress, fire hazards, heat or cold conditions, tripping hazards, noise exposures, radiation exposures and chemical exposures. These types of hazards are addressed with a facility-wide risk assessment.

	In this context, risk is the product of the occupancy, likelihood, and severity. Points for occupancy, likelihood, and severity are based on a stepwise numerical system. A specific range of point values for risk is associated with one of five descriptive classes of risk: negligible, acceptable, moderate, substantial and intolerable.
Facility Use Agreement (FUA)	A landlord-tenant contract that defines the operational safety envelope for each building and establishes an agreement among occupants and support services for conducting work within this framework. The FUA functions as an integrating reference document that links building specific operational criteria with Laboratory-wide management systems and information services.
hazard	A known source of danger where failure to designate it may lead to accidental injury or illness to staff, the public, or both, or to the environment (e.g., operation, radiation, chemical, high pressure, electrical, mechanical, etc.).
internal work	Work that is performed by individuals who reside in the facility or organization.
job risk assessment	<p>A job is a sequence of separate steps or activities that together accomplish a work goal. Each of the steps or activities is analyzed for associated hazards.</p> <p>In this context, risk is the product of the occupancy, likelihood and severity. Points for occupancy, likelihood and severity are based on a stepwise numerical system. A specific range of point values for risk is associated with one of five descriptive classes of risk: negligible, acceptable, moderate, substantial and intolerable.</p>
manual/hand delivery	Any delivery by a supplier/shipper to BNL that does not require the use of special, powered equipment other than manual material-handling equipment.
office environment	A work environment where there are no known source(s) of danger that may lead to accidental injury or illness to staff, the public, or both, or to the environment. Typical work includes management, administrative duties, office support, and clerical activities.
Operational Safety Envelope	The conditions/boundaries by which safe operation is maintained within a process or facility.
prescribed work	Use of work documents that are a formal set of instructions or guidelines (e.g., standard operating procedures (SOPs), contractor health and safety plan, contractor procedure, operating/maintenance manual.) The goal of prescribing the way work will be performed is to control the work such that the levels of hazard, complexity, and coordination are low.

Principal Investigator/Responsible Person (PI/RP)	<p>The person who takes responsibility for all the members of a team that carry out an experiment or experimental program at BNL. The PI/RP may or may not be a BNL employee, but they are able to act as a spokesperson for their experiment for the purposes of this Subject Area.</p> <p>The PI/RP is not solely responsible for the technical details and hazards associated with the experiment. This responsibility resides jointly with the PI/RP, ERC, ESRC and the processes covered by this Subject Area.</p>
routine/repetitive experiments	<p>Experiments that are</p> <ul style="list-style-type: none"> • Repeated over time by appropriately qualified persons; • Have a well-understood set of hazards that have been reviewed; • Have established controls.
Significant Experimental Modifications	Any changes that would exceed the pre-established controls/limits approved by the Department Chair/Division Manager.
substitution of hazards	<p>Substitution of a hazardous chemical/substance with one that is less or non-hazardous. Extreme care must be taken to ensure that one hazard is not being exchanged for another, especially one that could even be a more serious hazard.</p> <p>Note: Although substitution is the most direct method of reducing hazards, it is not always practical. A very careful evaluation must be done before any substitution.</p>
work	Activities that involve the design, operation, maintenance, modification, construction, demolition, or decommissioning of facilities, systems, or experiments by BNL or non-BNL staff.
work permit	A document used to define the scope of work as per the work request, analyze the ES&H hazards, determine the work controls, plan the work, review and approve the plan, conduct a pre-job briefing, authorize the start of work, and solicit worker feedback.
work rated as high-hazard	<p>Work requiring the coordinated actions of multiple organizations and outside contractors to prevent serious injury to staff, significant damage to equipment or structures, or releases of reportable quantities of potentially hazardous materials to the environment (e.g., any one of the ESS&H issues, work coordination, or work complexity categorized as a high hazard).</p> <p>See the exhibit Application of Graded Approach in the Graded</p>

	Approach for Quality Requirements Subject Area.
work rated as low-hazard	<p>Work requiring the attention of the average worker to prevent minor injury. Failure to correctly perform low-hazard work would not damage equipment or structures or release potentially hazardous materials to the environment, except as a result of gross negligence (e.g., ESS&H issues, work coordination, and work complexity categorized as low hazard levels).</p> <p>See the exhibit Application of Graded Approach in the Graded Approach for Quality Requirements Subject Area.</p>
work rated as moderate-hazard	<p>Work requiring the coordinated actions of multiple organizations or one or more person(s) to prevent any injury to staff, minor damage to equipment or structures, or a release of hazardous materials to the environment (e.g., any one of the ESS&H issues, work coordination, or work complexity categorized as a moderate hazard).</p> <p>See the exhibit Application of Graded Approach in the Graded Approach for Quality Requirements Subject Area.</p>
worker planned work	<p>The level of proficiency that allows a worker to perform tasks independently due to their level of training and documented experience. This concept applies to all staff from scientists and technicians to the trades persons and laborers.</p> <p>It is applied to routine, low-hazard tasks that support fulfillment of a facility or group's function. The tasks can range from complex to simple day-to-day activities. Each organization determines their worker planned work tasks.</p>

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